18. (amended)   The apparatus of Claim 13 wherein said error measurement comprises a comparison between said combinations of [probability assignments] Dempster-Shafer bpa's and a known desired result.

19. (amended)   The apparatus of Claim 13 wherein said error measurement comprises a comparison between said [probability assignments] Dempster-Shafer bpa's and a set of characteristics of a desired result.

20. (amended)   The method of Claim 13 wherein said error measurement comprises a comparison between said combinations of [probability assignments] Dempster-Shafer bpa's and a set of characteristics of a desired result.

21. (amended)   The method of Claim 13 wherein said updates to said Dempster-Shafer bpa's are calculated using a gradient-descent rule.

Please delete Claims 4 and 16.

REMARKS

Claims 1-21 are pending in the application, of which claims 1 and 13 are independent claims. In the office action dated September 8, 1998, the Examiner rejected all claims under 35 U.S.C. §101 as allegedly being directed to non-statutory subject matter, and under 35 U.S.C. §112 as allegedly not enabling and indefinite. The Examiner rejected claims 1, 2, 4, 8-12 and 16-21 under 35 U.S.C. §102 as being unpatentable over one or more of U.S. Patent No. 5,493,729 to Nigawara et al. ("the '729 patent"), U.S. Patent No. 4,754,410 to Leech et al. ("the '410 patent") and U.S. Patent No. 4,649,515 to Thompson et al. ("the '515 patent").

- 5 -

Additionally, the Examiner rejected claims 3, 5-7 and 15 under 35 U.S.C. §103 over the '729 patent in view of either U.S. Patent No. 5,778,157 to Oatman et al. ("the '157 patent") or U.S. Patent No. 5,787,885 to Lemelson ("the '885 patent").

The rejection of claims as non-statutory

The Examiner rejected claims 1-12 as non-statutory because the claims were allegedly not limited to a practical application within the technical arts. Claims 1-12 have been amended to recite the practical application of recognizing an object and making a determination of whether the object is a target. The claims as amended now recite a method that manipulates real-world data representing a physical object to refine a probability that the object includes a target. Accordingly, applicants submit that claims 1-12 as amended are directed to statutory subject matter.

Claims 13-21 were also rejected as non-statutory. These claims have been amended to recite a process that executes the method in amended claims 1-12. Accordingly, for the same reasons that the underlying method of claims 1-12 is statutory, the apparatus recited in claims 13-21 is also statutory.

The rejection of claims as indefinite

Claims 1-21 were rejected as indefinite for failing to be limited to technological arts. The claims have been amended to recite the practical application of determining if an observed object includes a target. Specifically, the claims now recite gathering information from a sensor, wherein the information is representative of a characteristic of the object. The gathered information is then used to develop Dempster-Shafer basic probability assignments and combinations of basic probability assignments that represent a probability that the observed object includes a target. The basic probability assignments and the

- 6 -

combinations of the basic probability assignments are then processed to determine the error present. Based on the error present, the probability that the observed object includes a target is updated.

The rejection of claims and specification as non-enabling

Applicants submit a declaration of one of the inventors (Kurt Reiser) under 37 C.F.R. §1.132 herewith as evidence that the disclosure is enabling to one skilled in the art. Mr. Reiser's declaration establishes that he is very familiar with the level or ordinary skill in the relevant art(s), and sets forth the education and experience associated with that level of ordinary skill. The declaration also states that Mr. Reiser believes that, using the application disclosure, it would take a person having ordinary skill in the relevant art approximately one day's work to generate a computer program that implements the claimed invention. Accordingly, the application specification is enabling to a person of ordinary skill, without undue experimentation.

The rejection of claims as anticipated by the '729 patent, the '410 patent and the '515 patent and as obvious over the '157 patent or the '885 patent in light of the '729 patent

The claims have been amended to more directly specify the use of Dempster-Shafer basic probability assignments (bpa's). None of the '729, '410, '515, '157 or '885 patents disclose or suggest the use of Dempster-Shafer bpa's or Dempster-Shafer probability calculus. Conversely, the cited art employs Bayesian probability calculus.

Moreover, the '729 patent, which is the primary reference used by the Examiner, can only associate one element of one layer with one element on the next layer. Conversely, the Dempster-Shafer approach taken in the present invention allows sets of

- 7 -

elements in one layer to be associated with <u>sets</u> of elements on other layers. Accordingly, the claimed Dempster-Shafer approach is significantly different from the Bayesian techniques used by the cited art.

Because none of the cited references disclose the use of Dempster-Shafer calculus or Dempster-Shafer bpa's, the applicants respectfully submit that the cited art cannot anticipate or render the present invention obvious (assuming, arguendo, that there is even a proper motivation to combine the references in the manner suggested).

Applicants believe that the claims, as amended, now stand in condition for allowance and respectfully requests that the Examiner reconsider and withdraw the rejections and allow the claims. If the Examiner believes that an interview would be beneficial in resolving the remaining issues in this case, the Examiner is invited to telephone the undersigned at the number listed below.

Respectfully submitted,

K. Reiser et al.

December 8, 1998   By: _V. D. Duraiswamy_
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